USGS
science for a changing world

USGS in Texas – "Boots on the ground" Science right in your backyard!

Daniel K. Pearson, GIS Specialist
USGS-Texas Water Science Center
NCTCOG GIS Meeting
05.08.13

U.S. Department of the Interior
U.S. Geological Survey

Introduction to USGS

- Dept. of Interior - Founded in 1879
- Six Science Mission Areas
  - Water Resources
  - Ecosystems
  - Energy, Minerals and Environmental Health
  - Core Science Systems
  - Climate and Land-Use Change
  - Natural Hazards
- Nationwide about 9,000 employees
- Conducts interdisciplinary scientific monitoring, assessment, and research

- Federal Agency
- Scientific Mission
- Non-Regulatory

USGS

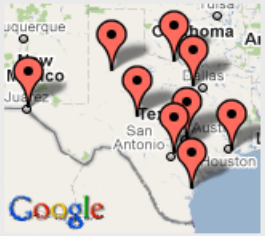
Texas Geospatial Liaison

- Claire Devaughan
  - cdevaugh@usgs.gov
  - 512-927-3583
- Leverage funding across organizations to provide significant cost savings, reduce redundancy in geospatial data acquisition and stewardship, and ensure availability of common base data to a broad range of users and applications.
- http://liaisons.usgs.gov/geospatial/Texas/

USGS

Search this site:
Google™ Custom S Search

ABOUT THE TEXAS WSC



- Office information
  - Locations
- Frequently Asked Questions
- Contacts for Management and Specialists
- USGS Directory
- Seminars
- Cooperators
- Information Requests
  - Policies
  - Charges
  - Information Quality Requests
- Employment
- Education
- Emergency Information

USGS IN YOUR STATE

USGS Water Science Centers are located in each state.

Texas Water Science Center Locations

The Texas Water Science Center headquarters is located in Austin. Other offices include program offices in Houston, San Antonio, Fort Worth, and San Angelo. Addresses and phone numbers are provided below, and you can view a map of the offices by selecting the office link below.

Main Office

USGS Texas Water Science Center
1505 Ferguson Lane
Austin, TX 78754
Phone (512) 927-3500
Fax (512) 927-3590
Lodging/M&IE: $115/$71

Program Offices

Corpus Christi - CERC Field Research Station
Map | Lodging/M&IE: $90/$51
6300 Ocean Drive CESS Bldg., Rm. 111, TAMU-CC Box 339, Corpus Christi, TX 78412
Phone (361) 985-6266 Fax (361) 985-6268

El Paso - West Texas Program Office
Map | Lodging/M&IE: $91/$51
10737 Gateway West, Suite 350, El Paso, TX 79935
Phone (915) 534-6308 Fax (915) 534-6299

Fort Worth - North Texas Program Office
Map | Lodging/M&IE: $151/$56
2775 Altamesa Blvd, Fort Worth, TX 76133
Phone (817) 263-9545 Fax (817) 361-0459

Houston - Gulf Coast Program Office
Map | Lodging/M&IE: $118/$71
19241 David Memorial Dr, Ste 180, Conroe, TX 77385
Phone (936) 271-5300 Fax (936) 271-5399

Lubbock - North Texas Program Office
Map | Lodging/M&IE: $70/$46
Geoscience Department
2500 Broadway, Texas Tech University, Lubbock, TX 79409-1053
Phone (806) 742-3129 Fax (806) 742-0100

San Angelo - West Texas Program Office
Map | Lodging/M&IE: $70/$46
944 Arroyo Drive, San Angelo, TX 76903
Phone (325) 944-4600 Fax (325) 942-0495

San Antonio - South Texas Program Office
Map | Lodging/M&IE: $117/$66
5563 DeZavala, Ste. 290, San Antonio, TX 78249
Phone (210) 691-9200 Fax (210) 691-9270

Water Resources Mission –

…to provide hydrologic information and understanding needed by others to achieve the best use and management of the Nation's water resources. **USGS accomplishes this mission in cooperation with State, Local, and Other Federal Agencies.**

“In cooperation with…..”

- Work with over 100 municipalities, river authorities, groundwater districts, local, state, and Federal agencies

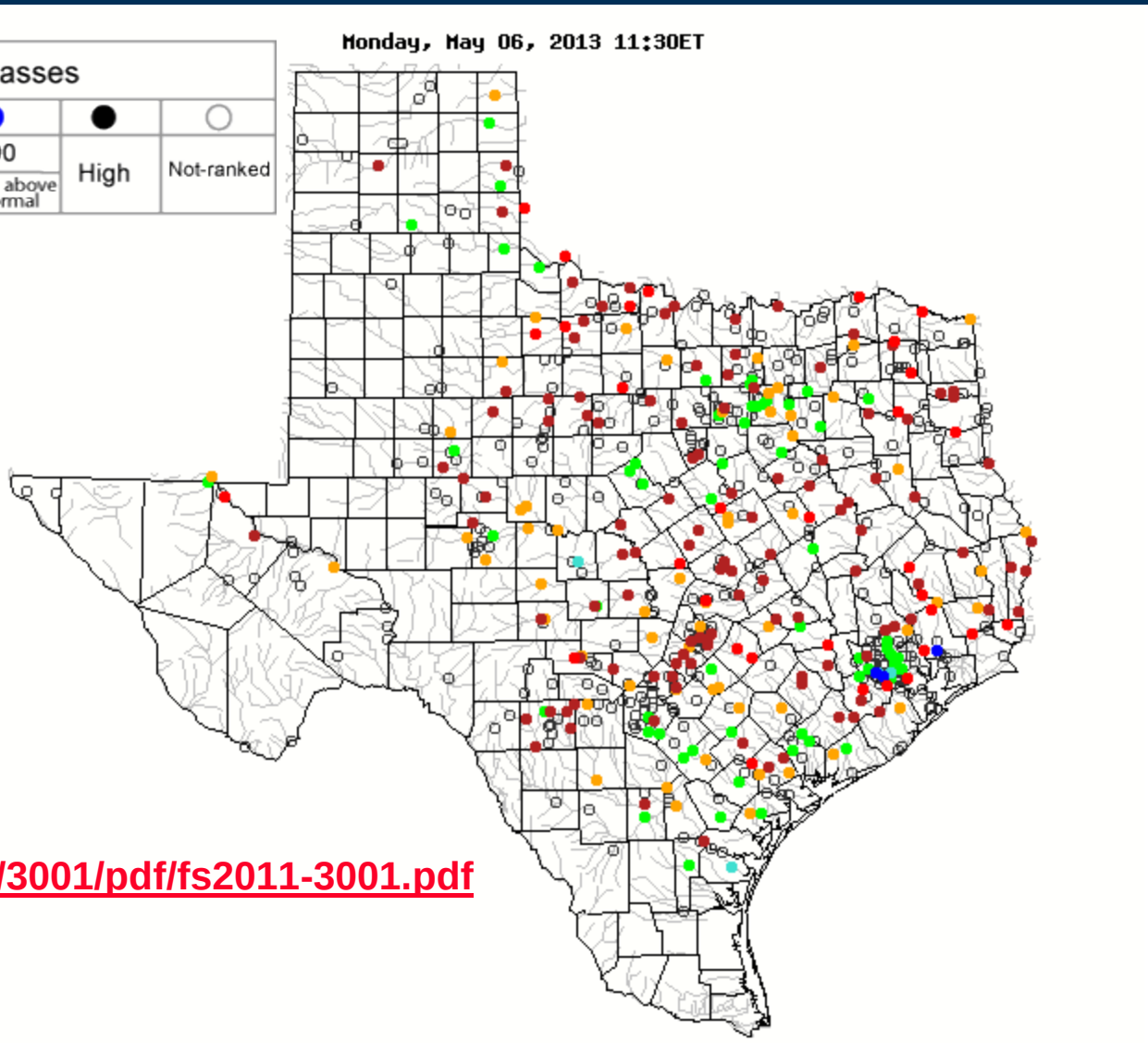
Hydrologic Investigations

- Water Availability – GW Modeling
- Gain/Loss Investigations
- Aquifer Storage and Recovery
- Flood Frequency Analyses
- Land Use Effects/Watershed Modeling
- Contaminant Distribution and Transport
- Drinking Water Quality
- Sediment Coring/Age Dating
- Data Collection – Streamgage, Reservoir

USGS

Real-time Streamgage Data

Explanation - Percentile classes							
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		



http://pubs.usgs.gov/fs/2011/3001/pdf/fs2011-3001.pdf

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TXWSC Personnel

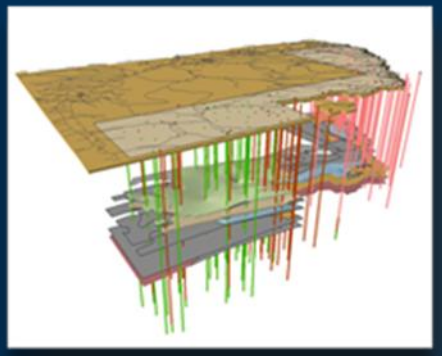
- About 140 total staff in Texas
  - Majority support Data Program

- Hydrologic Studies and Research Sections
  - 1 section per program office
  - Approx. 35 FTEs and several students (primarily Hydrologists, Physical Scientists, Civil Engineers, Geophysicists, Biologists)

USGS

Data and Spatial Studies Section

- Majority in Austin, 1 in San Antonio
- Currently 7 FTEs and 2 student (6 Geographers, 2 IT Specialists, 1 Hydrologist)
- Section dedicated to geospatial data manipulation and visualization over the web
- Unique within USGS Water Resources
- 50% collaborative - 50% GIS-centric project



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What Does DSS Do?

- Data management (ETL processes, data integration)
- Database-centric projects (design, management)
- GIS/spatial analysis/data production
- Modeling/visualization
- Web mapping
- Programming/custom tools
- Field mapping
- Data recovery
- Project overviews at http://tx.usgs.gov/GIS/

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Infrastructure

- Each office has network-attached storage device
  - 16 TB Storage Area Network (SAN) total
  - ~8TB Local disk storage
- Web and enterprise GIS and RDMBS: ArcGIS Server 10.1; ArcSDE 9.3; MS SQL Server
- Windows platform servers (Dell, IBM)
- Dedicated production and development datbase/web servers
- Subversion client: Tortoise SVN

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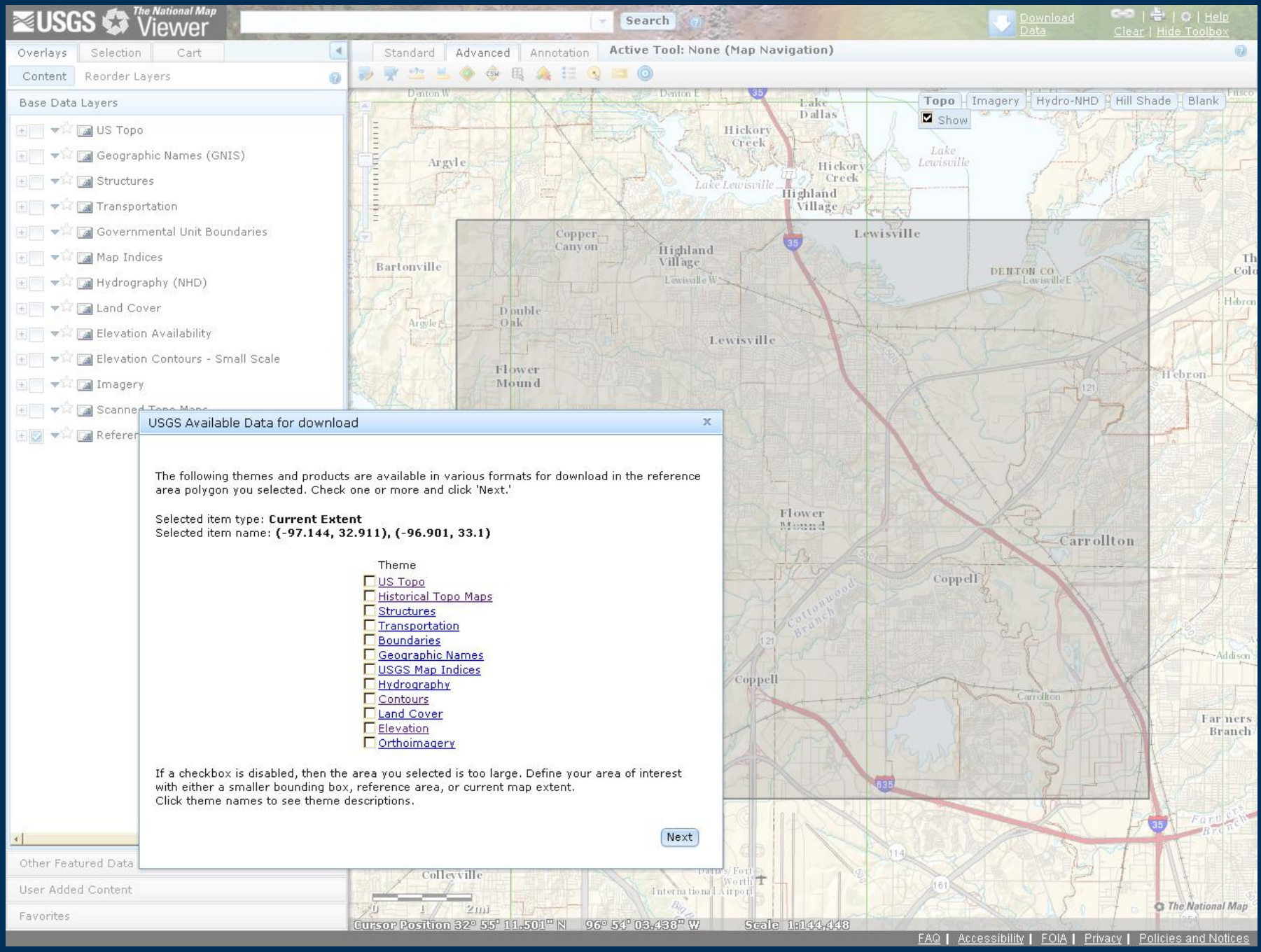
Where do I get Geographic Data?

- National Atlas -- http://nationalatlas.gov/
  - National source of small-scale data (1M, 2M, 10M)
- National Map -- http://nationalmap.gov/
  - Lots of information here!
  - Orthoimagery, Elevation, Geographic Names, Hydrography, Boundaries, Transportation, Structures, Land cover… more
  - Viewer
  - http://viewer.nationalmap.gov/viewer/
  - Download directly from the viewer!

USGS

The National Map


USGS The National Map Viewer
Search
Download Data
Help
Clear | Hide Toolbox
Overlays
Selection
Cart
Content
Reorder Layers
Base Data Layers
US Topo
Geographic Names (GNIS)
Structures
Transportation
Governmental Unit Boundaries
Map Indices
Hydrography (NHD)
Land Cover
Elevation Availability
Elevation Contours - Small Scale
Imagery
Standard
Advanced
Annotation
Active Tool: None (Map Navigation)
Topo
Imagery
Hydro-NHD
Hill Shade
Blank
Show
USGS Available Data for download
The following themes and products are available in various formats for download in the reference area polygon you selected. Check one or more and click 'Next.'
Selected item type: Current Extent
Selected item name: (-97.144, 32.911), (-96.901, 33.1)
Theme
US Topo
Historical Topo Maps
Structures
Transportation
Boundaries
Geographic Names
USGS Map Indices
Hydrography
Contours
Land Cover
Elevation
Orthoimagery
If a checkbox is disabled, then the area you selected is too large. Define your area of interest with either a smaller bounding box, reference area, or current map extent.
Click theme names to see theme descriptions.
Next
Other Featured Data
User Added Content
Favorites
Lewisville
Flower Mound
Carrollton
Coppell
Highland Village
Lake Dallas
Hickory Creek
Argyle
Bartonville
Double Oak
Copper Canyon
Hebron
Addison
Farmers Branch
Colleyville
Cursor Position 32° 55' 11.501" N 96° 54' 03.438" W
Scale 1:144,448
FAQ | Accessibility | FOIA | Privacy | Policies and Notices

Where do I get Geographic Data?

- US Topo
  - New, digital topographic maps at 1:24,000 scale
  - Began in 2009, updated version available for Texas (2013)
  - "US Topo is the primary source of publicly available geographic data"
  - http://store.usgs.gov
    - Map Locator and Downloader
      - Search function is simple, click on the balloon and download your quad one by one or batch
      - Historic topos available
      - GeoPDF

USGS

Map Locator & Downloader

DOI Disclaimer on Google Maps API

Don't see the Map Locator & Downloader? Help | Having trouble? Call: 1-888-ASK-USGS (1-888-275-8747, Select Option 2) or Write: usgsstore@usgs.gov for help.

Search: grapevine, TX | Address or Place | Go | [Search Help] or

Find a place on the map [Navigation Help]

NAVIGATE:
Double click to re-center, click and drag to pull the map around, zoom in and out.

MARK POINTS:
Click on a place to add a marker.

NOTES:
Switch between Navigate and Mark Points at any time.

The following map footprints appear when you are in the Mark Points mode and zoomed in:
7.5 and 15 Minute

SELECT AND GET YOUR MAPS:
Click marker to see an information bubble showing maps available, then click on "order", "download", or add maps your download cart.

View Download Cart

Clear Markers | Reset Map

Hide US Topo

US Topo

Where do I get Geographic Data?

- National Hydrography Dataset
  - http://nhd.usgs.gov/
  - 100K and 24K hydro data for the Nation
- National Elevation Dataset
  - http://ned.usgs.gov/
  - 30m, 10m, 3m elevation data products
- National Landcover Dataset
  - http://www.mrlc.gov/
  - 30m resolution landcover data and change products from 1992, 2001 and 2006

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Where do I get Water Data?

- National Water Information System
- NWIS Web
  - http://waterdata.usgs.gov/
  - Current conditions – Sites with real-time or recent surface-water, groundwater or water quality data
  - NWIS Mapper is useful for exploring available data, both active and historical sites

USGS

National Water Information System: Mapper

Sites | Map Layers

Search

Search by Street Address:
Enter Street Address

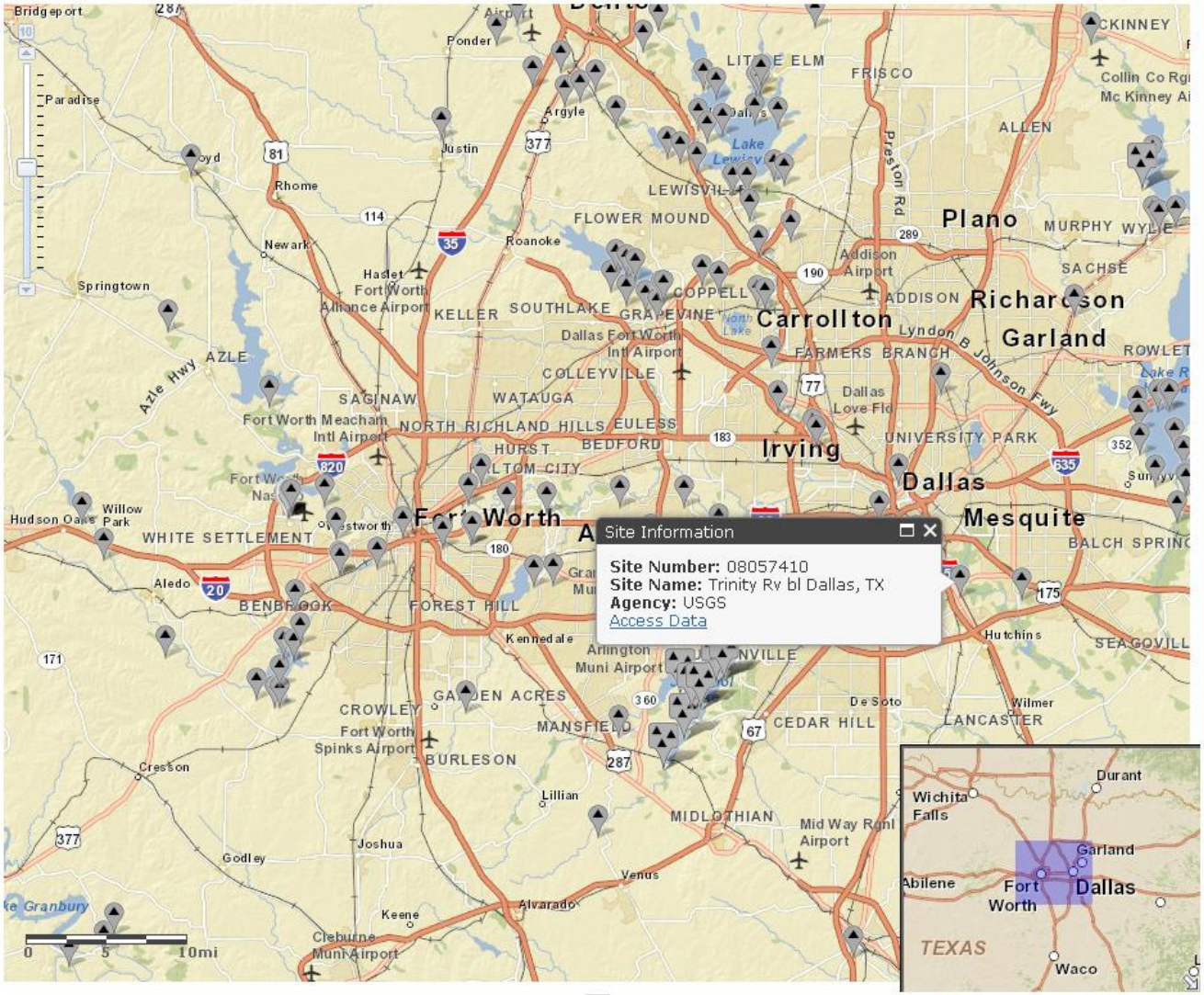
Search by Place Name:
Enter Place Name

Search by Site Number(s):
Enter Site Number(s)

Search by State/Territory:
Select an Area

Search by Watershed Region:
Select a Region

- Surface-Water Sites
- Groundwater Sites
- Springs
- Atmospheric Sites
- Other Sites



Help

Page Info

USGS Home
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National Water Information System: Web Interface

USGS Water Resources (District Access)

Data Category: Surface Water | Geographic Area: United States | GO

News - updated April 18,2013

USGS 08057410 Trinity Rv bl Dallas, TX

PROVISIONAL DATA SUBJECT TO REVISION

Available data for this site | Time-series: Daily data | GO

Funding for this site is provided by the cooperators / programs below:

City of Dallas Water Utilities Department

National Streamflow Information Program (NSIP)

NAWQA Program

Cooperative Water Program

Advanced Hydrologic Prediction Service

Retransmission, forecasts and summary by the National Weather Service

This station managed by the Fort Worth Field Unit.

Available Parameters	Period of Record
☐ All 2 Available Parameters for this site	
☑ 00065 Gage height(Mean,Max.,Min.)	1988-10-01 2013-05-05
☑ 00060 Discharge(Mean,Max.,Min.)	1956-11-01 2013-05-05

Output format
- ◉ Graph
- ○ Graph w/ stats
- ○ Graph w/ meas
- ○ Graph w/ (up to 3) parms NEW
- ○ Table
- ○ Tab-separated

Days (365)

-- or --

Begin date 2012-05-05

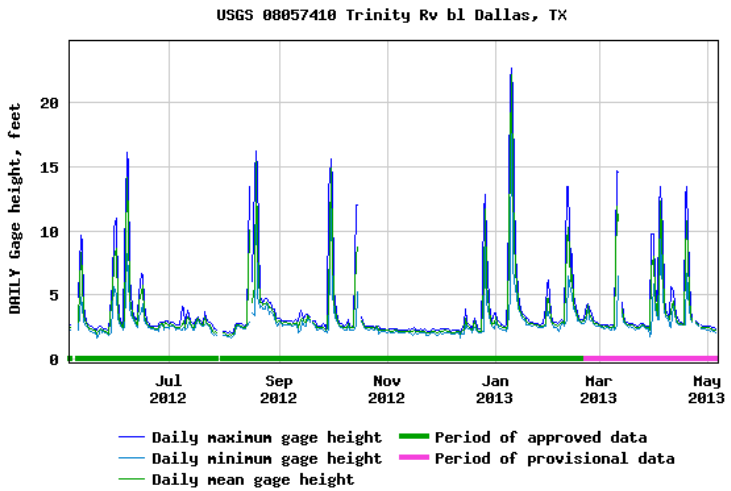
End date 2013-05-05

GO

Summary of all available data for this site

Instantaneous-data availability statement

Gage height, feet



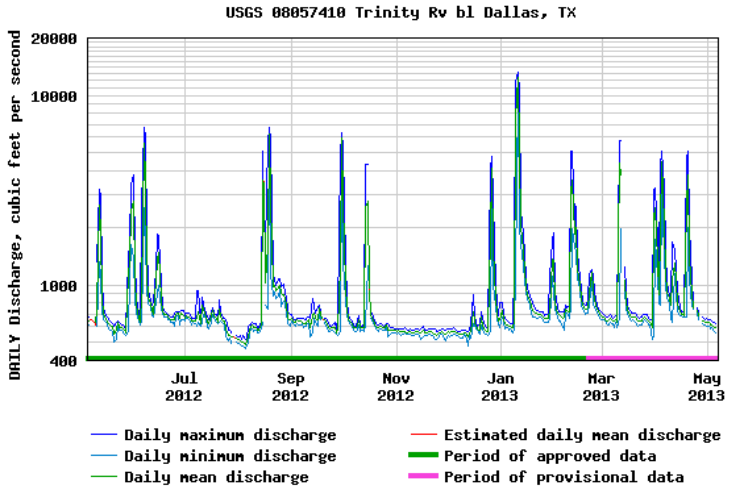
Create presentation-quality graph. P00065 DD07

Add up to 2 more sites and replot for "Gage height, feet"

Add site numbers

GO

Discharge, cubic feet per second



Create presentation-quality graph. P00060 DD15

Add up to 2 more sites and replot for "Discharge, cubic feet per second"

Add site numbers

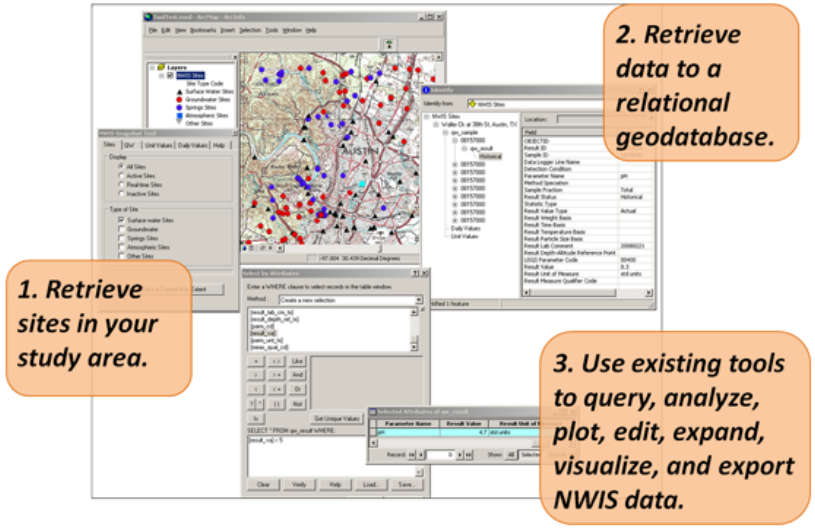
GO

NWIS Snapshot

What is the NWIS Snapshot?

The NWIS Web Services Snapshot Add-In gives ArcGIS users the ability to query NWIS web services and download a "snapshot" of NWIS data from the web services to a geodatabase.

The geodatabase, provided with the Snapshot Add-In installation files, has built-in relationships between sites and measurements taken at each site so users can run powerful queries, import tables and build new relationships with the NWIS data, and edit the data while maintaining the built-in relationships.



After requesting data from NWIS web services and populating the geodatabase, standard ArcGIS functions may then be used to visualize, analyze, and export data to other analysis software also. Aside from the software download links, this website contains tutorials that demonstrate how to install and use the NWIS Web Services Snapshot Add-In for ArcGIS.

Download Latest Version

http://txpub.usgs.gov/snapshot/

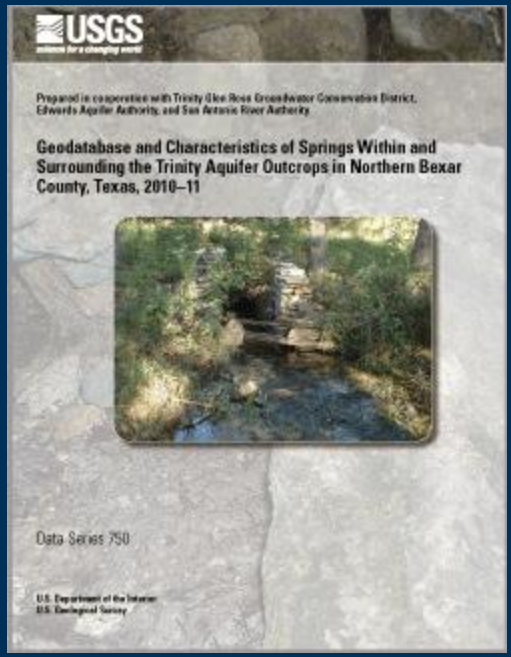
Where do I get Water Data?

- Texas Water Science Center homepage
  - http://tx.usgs.gov/
  - Texas focused data on drought, highlighted projects, data collection activities, publications of interest
  - Where do I find out about research projects completed in Texas?
    - http://tx.usgs.gov/publications/
- Publications Warehouse
  - http://pubs.usgs.gov

USGS

Recent Geodatabase Publications of Interest

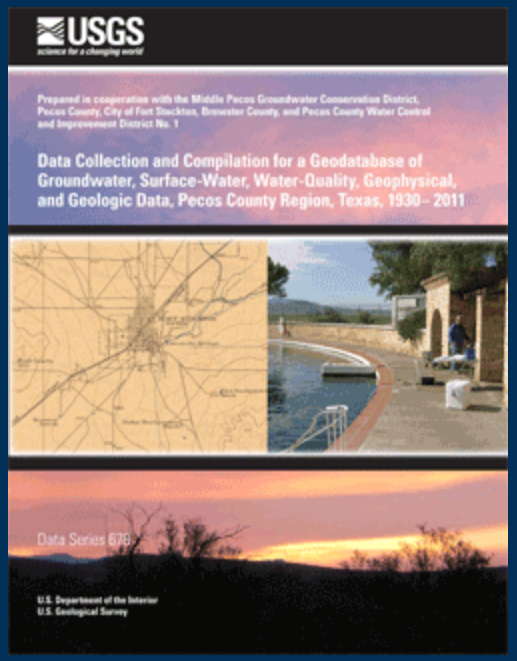
- **Geodatabase and characteristics of springs within and surrounding the Trinity aquifer outcrops in northern Bexar County, Texas, 2010-11**
  - **http://pubs.er.usgs.gov/publication/ds750**



USGS

Recent Geodatabase Publications of Interest

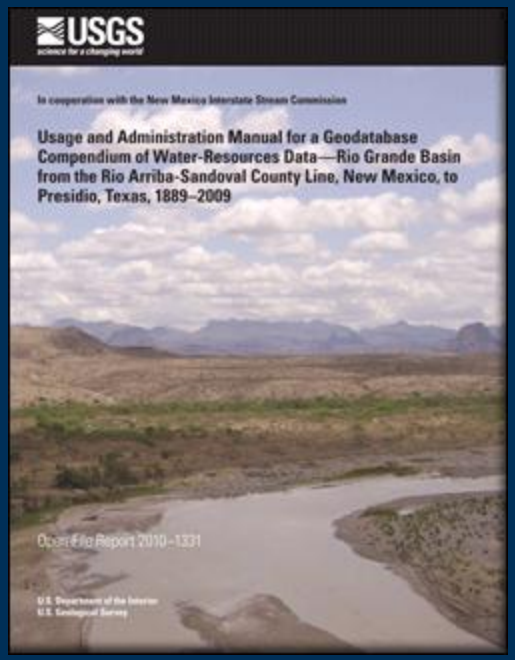
- Data collection and compilation for a geodatabase of groundwater, surface-water, water-quality, geophysical, and geologic data, Pecos County Region, Texas, 1930-2011
  - http://pubs.er.usgs.gov/publication/ds678



USGS

Recent Geodatabase Publications of Interest

- Geodatabase compendium of water-resources data-Rio Grande Basin from the Rio Arriba-Sandoval County line, New Mexico, to Presidio, Texas, 1889-2009
  - http://pubs.er.usgs.gov/publication/ofr20101331



USGS

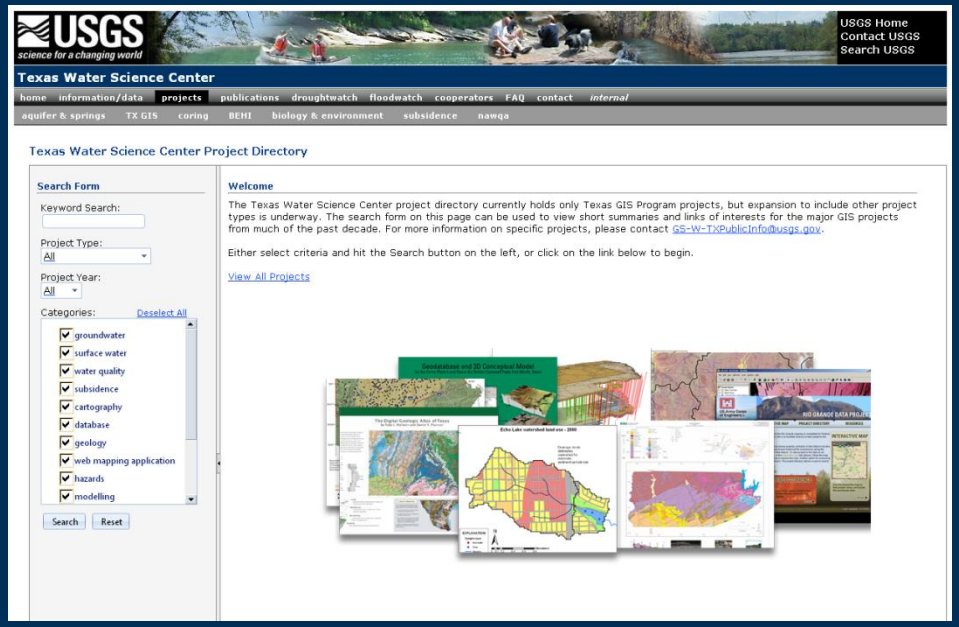
Recent Geodatabase Publications of Interest

- Geologic and Hydrogeologic Information for a Geodatabase for the Brazos River Alluvium Aquifer, Bosque County to Fort Bend County, Texas
  - http://pubs.er.usgs.gov/publication/ofr20071031
- Water-Level Altitudes 2012 and Water-Level Changes in the Chicot, Evangeline, and Jasper Aquifers and Compaction 1973–2011 in the Chicot and Evangeline Aquifers, Houston–Galveston Region, Texas
  - http://pubs.usgs.gov/sim/3230/

USGS

Where do I find even MORE GIS Data?

- http://tx.usgs.gov/GIS/
- GIS Homepage
- Information about our capabilities and searchable Project Directory
- From 2002-current



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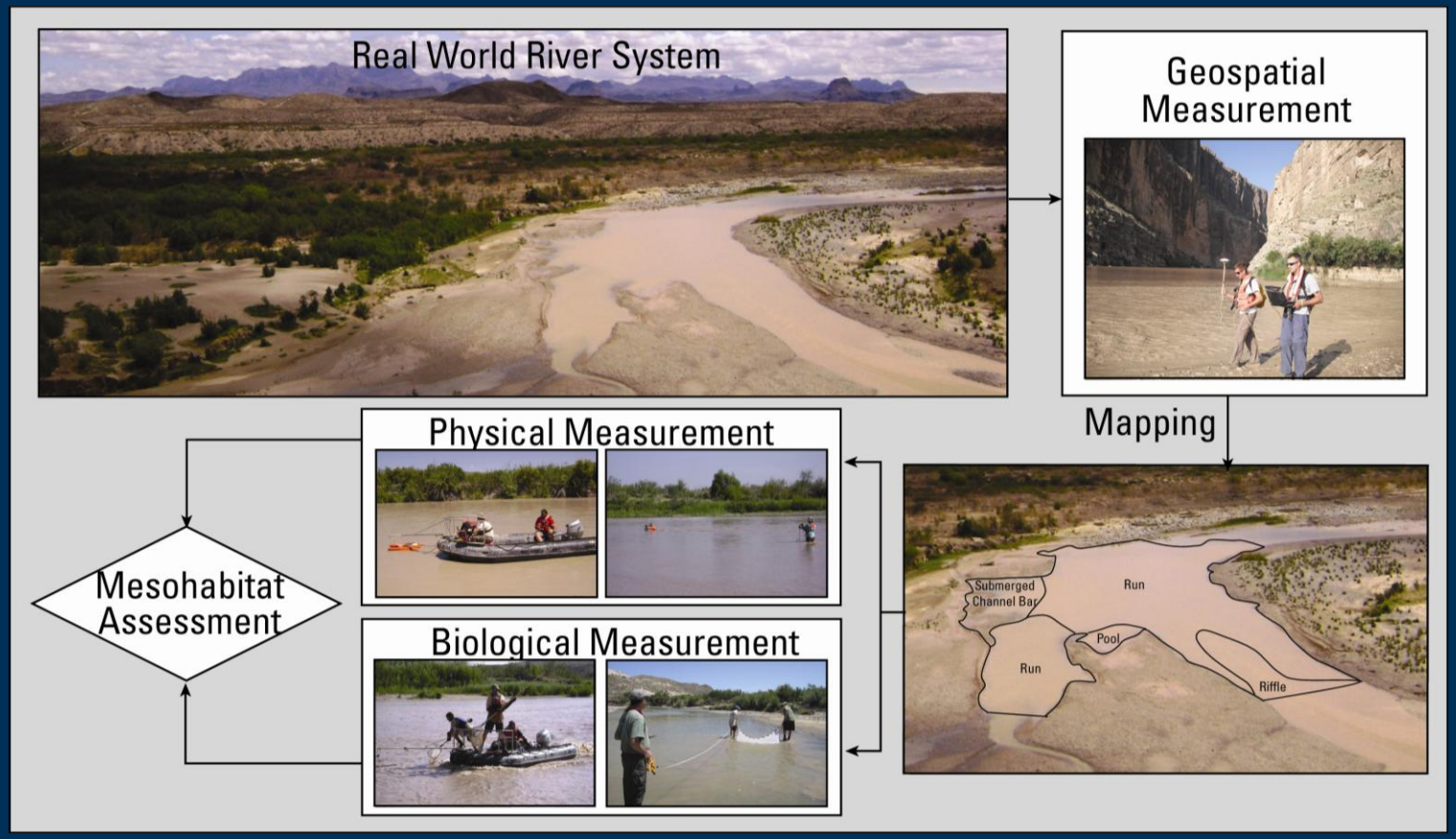
Additional Unique Capabilities

- **River Mapping – Mesohabitat Assessments**



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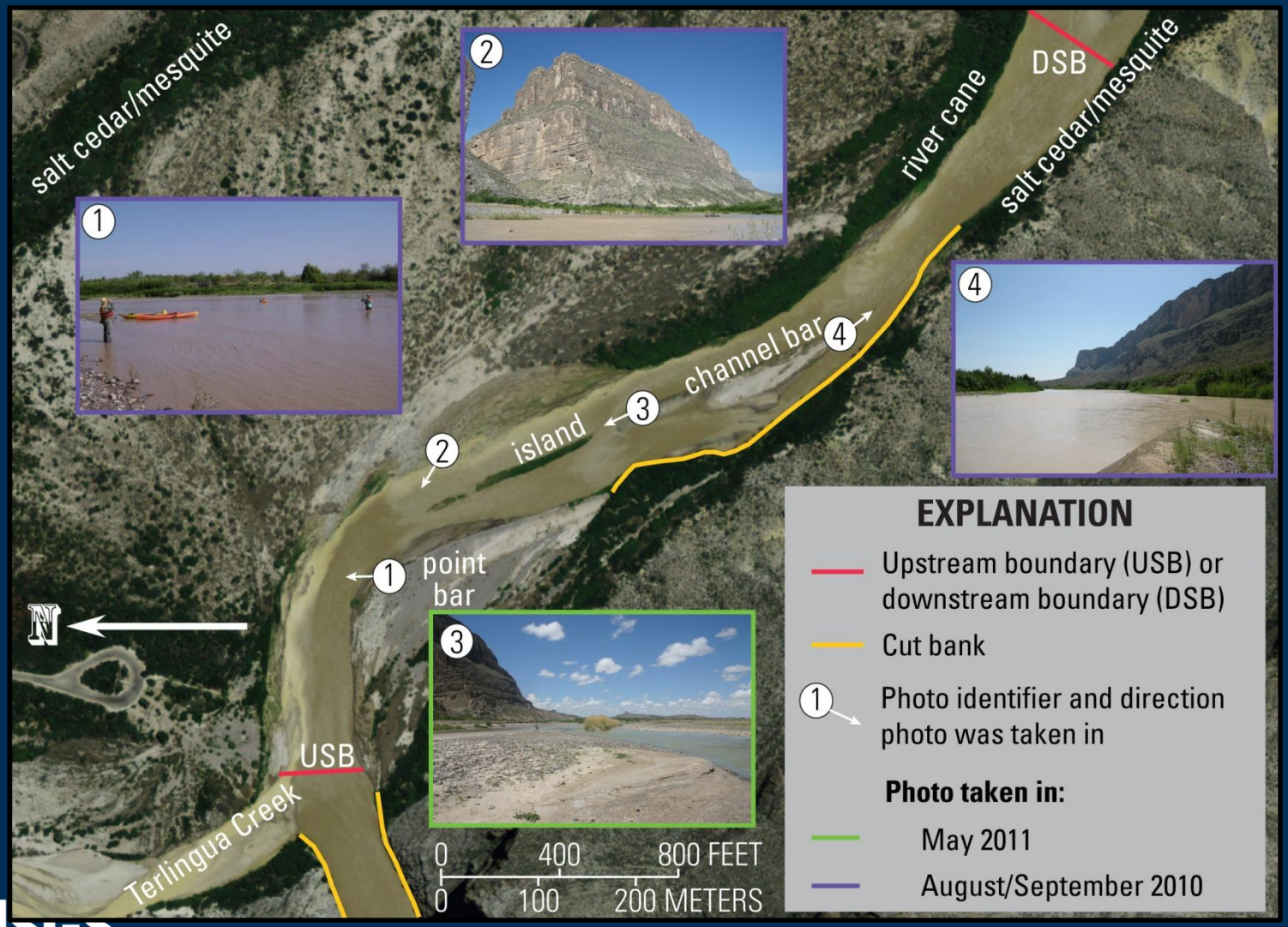
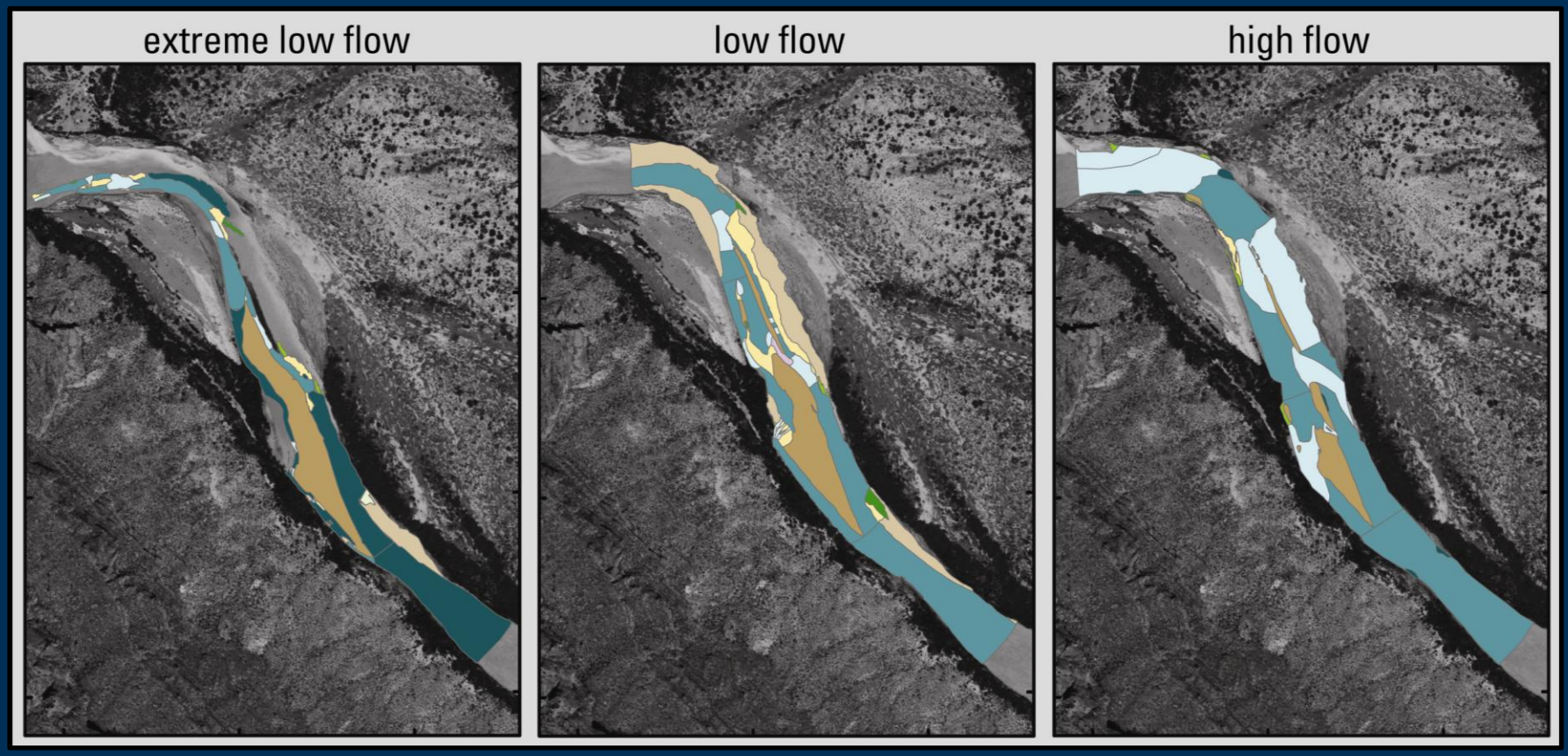
Big Bend National Park (Rio Grande Downstream of Terlingua Creek) -- Site Overview



Big Bend National Park (Rio Grande Downstream of Terlingua Creek) – Target Flows



Additional Unique Capabilities

- Mobile Application Development
- Fish Passage Mobile
  - USGS and MDEP teamed up in cooperation with USFWS Texas Fish and Wildlife Conservation Office (San Marcos, TX)
  - Mike Montagne and Pete Diaz (USFWS), Fon Duke and Doug Zellif (MDEP)
  - Build HTML5 mobile data collection platform to identify, map and capture photos of small impoundments and low water crossings that present a barrier for fish passage

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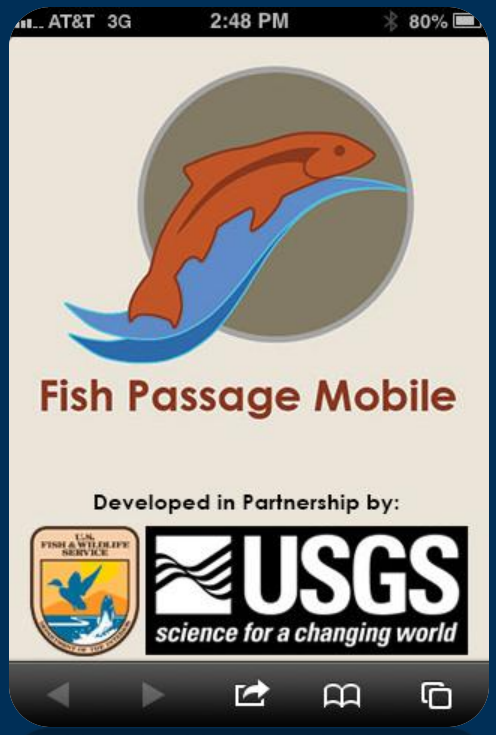
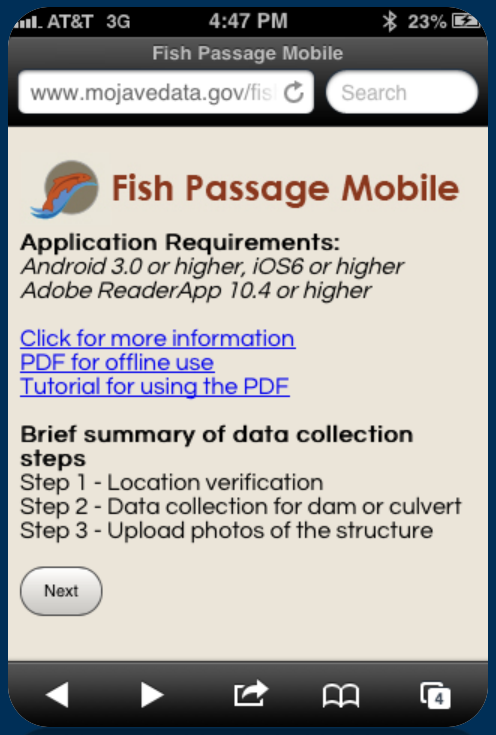
Demo

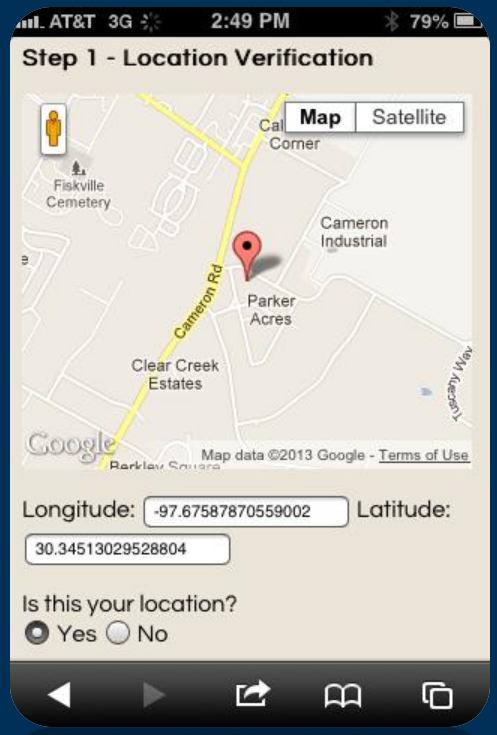
Splash Screen



Requirements



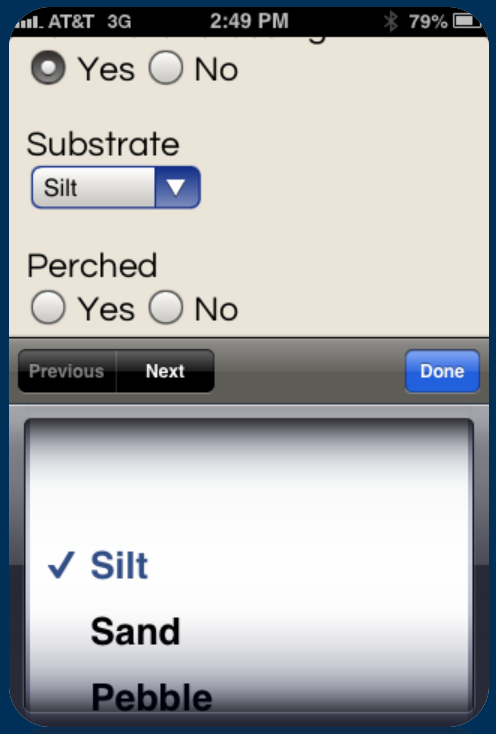
Location Map



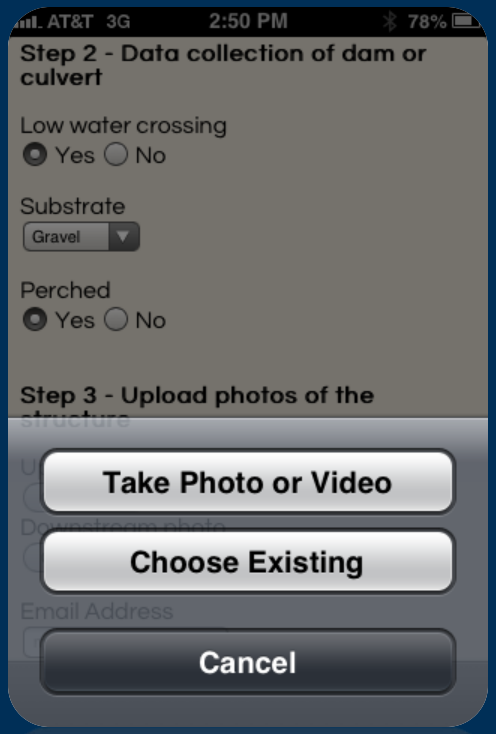
USGS

Demo

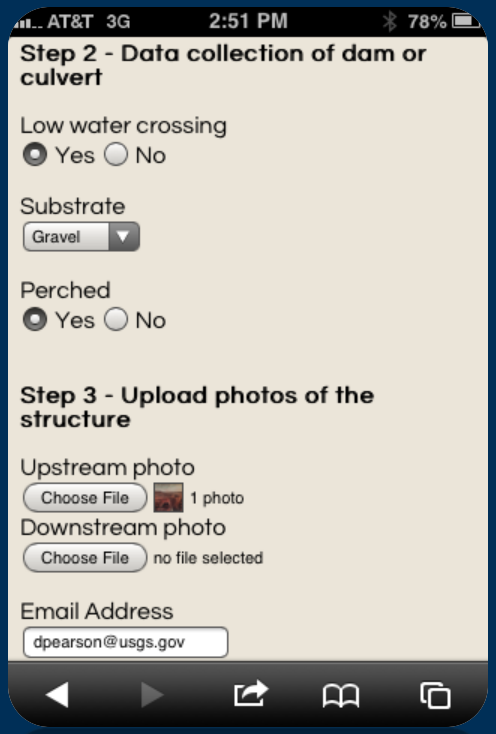
Data Collect



Capture Photo



Submit Data



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Backend Database

- Administration Portal built on MySQL
  - Allows for Data QC checks
  - Approve/Disapprove data submitted to the application
  - Map that allows you to view all approved data and distribution
- Download weekly dumps of the database in Excel and CSV format

USGS

Additional Unique Capabilities

- **Unmanned Aerial Vehicle – Imagery Acquisition**

USGS

Questions?

- Daniel K. Pearson (GIS Specialist)
- Data and Spatial Studies Section Chief
- USGS Texas Water Science Center
- dpearson@usgs.gov

Texas GIS Web Site:

http://tx.usgs.gov/GIS/